

**UTAH STATE IMPLEMENTATION PLAN**

**SECTION XXI**

**DIESEL INSPECTION AND MAINTENANCE PROGRAM**

Adopted by the Utah Air Quality Board  
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## Table of Contents

A. BACKGROUND .....	1
B. DIESEL INSPECTION AND MAINTENANCE (I/M) PROGRAM ELEMENTS.....	2
1. <i>Diesel I/M Program Implementation</i> .....	2
2. <i>Mandatory Maintenance</i> .....	2
3. <i>Diesel I/M Documentation</i> .....	3
4. <i>Diesel I/M Mechanic and Station Certification</i> .....	3
5. <i>Opacity Compliance</i> .....	3
a. <i>Heavy Duty Diesel Vehicle Opacity Test Requirements</i> .....	3
b. <i>Light Duty Diesel Vehicle Opacity Requirements</i> .....	4
c. <i>Diesel Vehicle Roadside Opacity Enforcement Requirements</i> .....	4
6. <i>Fleet Self-Certification</i> .....	4
7. <i>Waiver Provisions</i> .....	5
8. <i>Additional Strategies</i> .....	5
9. <i>Public and Diesel Industry Education</i> .....	5
10. <i>Enforcement</i> .....	5
11. <i>Diesel I/M Program Effectiveness Evaluation</i> .....	6
12. <i>Diesel Vehicle Air Pollution Fee</i> .....	6
13. <i>Implementation Schedule</i> .....	6

## **APPENDICES**

### **Appendix 1 Statutory Authorities**

- 1.a. Utah Code 19-2, Utah Air Conservation Act
- 1.b. Utah Code 41-6-147, ...Air pollution control devices
- 1.c. Utah Code 41-6-163.8, Diesel emissions program...

### **Appendix 2. Davis County**

- 2.a Program Ordinance #05-94, December 15, 1994
- 2.b Diesel Emissions Control Fee Ordinance

### **Appendix 3. Salt Lake County**

- 3.a Health Regulations #28, September 1, 1994
- 3.b Diesel Emissions Control Fee Standard

### **Appendix 4. Utah County**

- 4.a Diesel Vehicle Emissions Inspection Maintenance Program,  
October 24, 1994
- 4.b Diesel Emissions Control Fee Standard

### **Appendix 5. Program Equipment and Test Specifications**

# **UTAH STATE IMPLEMENTATION PLAN**

## **SECTION XXI**

### **DIESEL INSPECTION AND MAINTENANCE PROGRAM**

#### **A. BACKGROUND**

1. Davis, Salt Lake, and Utah counties for purposes of PM10 attainment began phase-in of a Diesel Inspection and Maintenance (I/M) Program consistent with the provisions of the PM10 SIP(Section IX.A) on November 1, 1994. The Davis, Salt Lake, and Utah County Diesel I/M ordinances are included as Appendices 2, 3, and 4.

Diesel I/M is a relatively new pollution control measure nationwide. New data and methods of diesel emission control will be evaluated as they become available. This program will be modified as more effective methods are identified. Any changes adopted will be in accordance with Utah's commitment to a 20% reduction in diesel particulate.

2. This program is designed to ensure compliance with Section 41-6-147 (2) and (3). (Appendix 1.b)

3. In addition to the health hazards associated with PM10 pollution in general, diesel particulate is mutagenic, carcinogenic, and toxic. Furthermore, diesel emissions are generally emitted into the breathing zone of the atmosphere. Once inspired into the lung, diesel particulates, because of their very small size, are not easily removed by the body. The toxic hydrocarbon fraction carried on the elemental carbon fraction is easily released and may react with lung tissue or be absorbed into the blood stream. The significant health threat presented by excessive levels of diesel PM10 make adoption of stricter control measures prudent.

4. This program is being adopted as one element of a strategy to satisfy federal legal requirements regarding attainment of PM10 National Ambient Air Quality Standards. This standard is violated currently in Salt Lake and Utah Counties with impact from Davis County. Diesel engines contribute significantly to the ambient PM10 concentration along the Wasatch Front, primarily in Davis, Salt Lake, and Utah Counties. As a significant contributor to the violations, diesel vehicles must be maintained and operated in such a manner as to minimize their particulate emissions.

5. Owners of gasoline vehicles have been subject to a mandatory inspection and maintenance program in Davis, Salt Lake, and Utah counties for a number of years. Implementation of a diesel inspection and maintenance program is considered by many to be an issue of public perception of equity.

## B. DIESEL INSPECTION AND MAINTENANCE (I/M) PROGRAM ELEMENTS

1. *Diesel I/M Program Implementation.* This Program is implemented in counties that impact PM10 nonattainment areas. Said counties, including Davis, Salt Lake, and Utah Counties, will hereafter be referred to as Diesel I/M Counties. All diesel-fueled vehicles registered or principally operated in Diesel I/M Counties will be required to comply with the provisions of this program. Specific details of the Diesel I/M Program elements were established by the Utah I/M Board consisting of health department representatives of each Diesel I/M County and the Division of Air Quality using input from the public and other interested parties. The program is implemented and managed by the local health department in each Diesel I/M County. The Diesel I/M Diesel Emission Control Program is dynamic and will allow for revision of the elements below, as more effective diesel emission control technologies and testing procedures are identified.

2. *Mandatory Maintenance.* Proper maintenance of diesel vehicles is paramount to minimizing air pollution from these sources. Repair of the emission-related components of failed vehicles will be mandatory, to the extent necessary to achieve compliance with opacity standards established pursuant to this SIP. The Mobile Source Division of the California Air Resources Board conducted a study of smoke opacity inspections of urban transit buses with respect to the frequency of emissions related maintenance. They found that frequent periodic smoke inspections are more effective than mandatory engine maintenance schedules for reducing the number of excessively smoking buses in operation.

A county-certified Diesel I/M mechanic will certify, by means of a repeated opacity test, that mandatory emission-related repairs have brought the vehicle into compliance. Repairs may include air and fuel filter replacement, adjustment of primary emission-related engine components to the manufacturer's specifications, replacement or repair of any missing or damaged manufacturer-installed emission control equipment, and repair or replacement of emission-related engine components not functioning per the manufacturer's specifications for the number of miles on the odometer.

3. *Diesel I/M Documentation.* Documentation of compliance with the Diesel I/M Program requirements consisting of a Diesel I/M Certificate of Compliance or Waiver will be required for annual diesel vehicle registration in Diesel I/M Counties.

To facilitate roadside enforcement, proof of Diesel I/M Program compliance in the form of a sticker may be required to be displayed on the vehicle windshield of diesel vehicles principally operated in Diesel I/M Counties.

Sufficient data to evaluate the effectiveness of the Diesel I/M Program will be recorded by mechanics on Diesel I/M Reports. These reports will be submitted to the appropriate Diesel I/M County health department. An automated and/or computerized data management system will be utilized. Standardized data elements are specified in each county regulation or ordinance (Appendices 2, 3, and 4) and in the Utah I/M Program Equipment and Test Specifications (Appendix 5).

4. *Diesel I/M Mechanic and Station Certification.* Diesel I/M County health departments will certify Diesel I/M mechanics and stations upon their demonstration of adequate training,

skill, and resources. Specific requirements for Diesel I/M certification are explicitly defined by each Diesel I/M County regulation or ordinance (Appendices 2, 3, and 4).

Diesel I/M Counties will provide Diesel I/M Program training to mechanics, diesel repair facility managers, and other interested parties. The training will include Diesel I/M test procedures, visual opacity training, a description of the components of diesel emissions and their impact on human health and the environment, technical aspects of repair specific to reduction of diesel emission opacity, mechanic and station Diesel I/M program responsibilities and Diesel I/M Program safety requirements.

All Diesel I/M County-certified diesel emission control mechanics and stations will be subjected to at least quarterly audits and one covert audit each year. Evidence of inadequacy may result in more frequent audits of individual mechanics or stations. An appropriate substitute for covert audit of self-certifying fleet mechanics and stations will be included in the program. Violation of the Diesel I/M Program rules may result in revocation or suspension of certification.

#### *5. Opacity Compliance*

*a. Heavy Duty Diesel Vehicle Opacity Test Requirements.* Heavy duty diesel vehicle compliance with diesel emission opacity standards will be determined for purposes of registration as specified in the Utah Diesel I/M Program Equipment and Test Specifications (Appendix 5). The test consists of measuring exhaust smoke levels as the accelerator pedal is rapidly depressed while the vehicle transmission is disengaged. Opacity will be measured by means of an opacity meter and recorded as a 500-millisecond running average on a recording device.

A cutpoint of 40% opacity has been shown by the California Air Resources Board to result in no greater than 5% errors of commission or omission at low elevations. The Society of Automotive Engineers is currently conducting high altitude studies to correlate opacity with elevation. Utah's Diesel I/M Program started with a cutpoint of 80% opacity for heavy duty engines. After the high altitude studies are complete the cutpoint may be changed. The cutpoints will be established and revised in conjunction with the fail rate to achieve a 20% reduction in diesel particulate pollution. The peak smoke certification value was found to be subject to a standard deviation of 10% when production variability within the engine family, deterioration factors, test variability, and state of maintenance were considered.

A limited number of engine families were certified with relatively high peak smoke opacities and may be incapable of achieving 500 milli-second running average opacities below 80% at high elevations. The Diesel I/M Counties will establish a procedure to allow a higher opacity standard for these engine families. The owner must submit proof of engine peak smoke certification, make, and horsepower to the appropriate Diesel I/M County office in order to be considered for a higher opacity standard.

*b. Light Duty Diesel Vehicle Opacity Requirements.* Light duty diesel vehicle exhaust opacity will be measured under load on a dynamometer with an opacity meter and recording device specified in Utah Diesel I/M Program Equipment and Test Specification (Appendix 5). An opacity cutpoint for light duty diesel vehicles will be established at a value sufficient to achieve a failure rate sufficient to ensure a 10% diesel particulate reduction. Specifications for the test, the opacity meter, the recording device, the dynamometer, safety requirements, and test documentation are specified in Appendix 5 of Section XXI.

c. *Diesel Vehicle Roadside Opacity Enforcement Requirements.* Roadside opacity compliance inspection/evaluation and citation of violators by law enforcement officers would be most effectively accomplished by means of a modified EPA Method 9 visual inspection/evaluation to be designed by the Executive Secretary. The Division of Air Quality will seek a Memorandum of Understanding (MOU) with State and local law enforcement agencies to enforce the roadside opacity limits. Training would be provided to law enforcement officers, certified Diesel I/M mechanics, and Diesel I/M auditors for performing this compliance function.

6. *Fleet Self-Certification.* Fleets of 25 or more heavy duty diesel vehicles may be self-certified if both the fleet mechanic doing the inspections and the facility is Diesel I/M Program certified. Self-certifying fleets will be required to perform opacity inspections with an opacity meter and recording device that meets Diesel I/M Program specifications (Appendix 5). Recording devices from the inspections will be maintained and subject to inspection by county staff during any audits. All fleet stations and mechanics certified to perform Diesel I/M self-certification will be subject to regular inspections by appropriate county auditors. During self-certifying fleet audits, county auditors will review vehicle emissions inspection and maintenance records and inspect a representative sample of vehicles with an opacity meter to verify compliance. Self-certifying fleet vehicles will also be subject to a quarterly test with visual evaluation of smoke opacity. Vehicles that exceed the opacity limit will be remeasured with an opacity meter and repaired if the meter confirms that the exhaust opacity exceeds the opacity standard. Self-certifying stations will maintain records of specific repairs performed to bring failed vehicles into compliance. As with any certified mechanic or station, violation of the Diesel I/M Program rules may result in revocation or suspension of certification. Operation of self-certified fleet vehicles in violation of Section 41-6-147 will be considered a violation of Section XXI.

7. *Waiver Provisions.* Waivers will be issued only in the absence of evidence of tampering with emission control devices installed by the manufacturer. A waiver may be issued on a one-time basis only. A minimum of \$500 must be spent on emissions related repairs without attaining compliance for waiver eligibility on a light duty diesel vehicle. A minimum of \$1500 must be spent on emissions related repairs without attaining compliance for waiver eligibility on a heavy duty diesel vehicle. The Diesel I/M Counties will establish procedures to ensure that waivers are kept to an absolute minimum.

8. *Additional Strategies.* DAQ staff will evaluate and propose adoption, as appropriate, of additional strategies regarding fuel specifications, emission control technology retrofitting, locomotive emission control requirements, idling ordinances, participation by commuters from outside the Diesel I/M Counties, and alternative fuels. DAQ staff may submit to appropriate federal authorities the recommendation that federal standards regarding control of diesel emissions from interstate traffic be adopted.

9. *Public and Diesel Industry Education.* Public education regarding Diesel I/M Program requirements and the anticipated environmental benefits will be provided to diesel vehicle owners. A period of intense public education will precede roadside enforcement of the opacity rules. The education effort will include informing drivers of operating practices and the fuel types that increase pollution and should be avoided. A written summary of the new Diesel I/M Program will be provided to diesel industry organizations with encouragement for inclusion of the information in their publications. A resource, such as the telephone number of county I/M technical centers, for obtaining additional information will be provided.

*10. Enforcement.* The Executive Secretary will encourage aggressive enforcement of Section 41-6-147 by law enforcement agencies. Pursuant to Section 41-6-147(Appendix 1.b), motor vehicles are required to comply with emissions requirements. The Utah Highway Patrol and other law enforcement agencies are authorized to cite drivers of vehicles emitting excess diesel smoke.

Notice of diesel opacity violations will be provided to appropriate railroad offices following observation of excessive locomotive exhaust by an observer that has successfully completed the DAQ smoke evaluation school. A mechanism to verify that the locomotive is repaired to compliance will be established.

County Diesel I/M auditors may on a random basis subject heavy duty diesel vehicles operated in that county to an opacity test conducted at their base of operation. Vehicles for which the county Diesel I/M office has received complaints of excessively smoking diesel vehicles will be subject to an opacity test of the vehicle(s) in question by the auditor. Owners of vehicles found to be in violation of the standard will be penalized as noted below.

The Utah Air Conservation Act 19-2-115 (Appendix 1.a) provides for imposition of penalties of up to \$10,000 per violation of the Act. Penalties for violation of this Program may be levied by authority of the Utah Air Quality Board Penalty Policy, R307-4, under which violation of automobile emission standards and requirements is a category D violation and may result in a penalty of up to \$299 per violation. Diesel I/M Counties will evaluate the penalty policy with respect to the Diesel I/M Program. Penalties should be sufficient to ensure that it is cheaper to fix the vehicle than to risk citation. Repair of smoking diesels, especially heavy duty vehicles, frequently exceeds \$500 and may cost as much as \$10,000. Should Diesel I/M Counties demonstrate the necessity for higher penalties, they will request that the Utah Air Quality Board consider revision of the penalty policy accordingly. However, the goal of the Diesel I/M Program is to reduce emissions by inspection and maintenance of vehicles, only assessing penalties when necessary.

The Division of Air Quality and Diesel I/M Counties will initiate an effort to obtain enforcement support from various law enforcement agencies. Diesel I/M County ordinances and regulations authorizing their Diesel I/M Program include provisions that provide for county enforcement of the requirements of said legal instruments.

A significant portion of the heavy duty diesel vehicles operated in Utah's PM10 non-attainment counties are registered outside the state. The Division of Air Quality will initiate an effort with the Department of Transportation, the Highway Patrol, and Diesel I/M Counties to cooperatively develop and conduct a diesel emission roadside and port-of-entry inspection program with effective and reasonable penalties. The purpose of these inspections will be to identify and subsequently force repair of heavy duty diesel-fueled vehicles that are emitting smoke in excess of Utah's opacity statute and rules.

*11. Diesel I/M Program Effectiveness Evaluation.* Utah initiated an effort to develop a national diesel emission control standards in 1992. That effort resulted in formation of a Society of Engineers committee to develop a test and the equipment specifications for diesel emission control. The committee has met for two years and is nearly finished with the specifications, SAE J1667. Peer review and field verification are all that remain. The field work is being conducted. The Utah I/M Program Equipment and Test Specifications (Appendix 5) are based on SAE J1667. EPA is also represented on the committee.



The Division of Air Quality, in conjunction with the Diesel I/M Counties, will establish a method to support anticipated emission reductions achieved by the Diesel I/M Program. The evaluation will consist of an analysis of data submitted on Diesel I/M Maintenance Reports, a field study to correlate actual opacity reductions with the required inspection and maintenance program emissions reductions, modeling evaluation (if available), and actual monitoring station data. A summary of an annual evaluation of current diesel control technology and strategies and recommended Diesel I/M Program changes will be submitted to the Executive Director by Diesel I/M County Health Departments by August 1 of each year after their Diesel I/M regulation or ordinance is adopted. The program will be reviewed and updated in light of the annual evaluation as deemed effective and reasonable by Diesel I/M County program managers.

*12. Diesel Vehicle Air Pollution Fee.* The Diesel I/M counties began assessing an annual Air Pollution Fee of \$10 payable upon registration of a diesel vehicle in a Diesel I/M county in 1991 to be used by the Diesel I/M counties to develop and implement the Diesel I/M Program.

### *13. Implementation Schedule*

June 8, 1990 ...	Utah I/M Board Preparation of an Initial Draft of the Diesel I/M Program Elements
June 13, 1990 ...	Draft Diesel I/M Program Elements Ready For UACC
June 22, 1990 ...	Air Conservation Committee Consider the Draft Elements for Public Hearing
Aug 10, 1990 ...	Utah I/M Board Submit Draft of Diesel I/M Program to BAQ
Aug 15, 1990 ...	Public Hearings for PM10 SIP Including Draft Diesel I/M Program
Sept 15, 1990 ...	Utah I/M Board Finalizes proposed Diesel I/M Program for Submission to UACC and county commissions
Sept 30, 1990 ...	Diesel I/M County Commissions Commit to Implement a Diesel I/M Program by July 1, 1993 that will reduce ambient diesel particulate by at least 20% whether by the test methods described in section b) of the UTAH DIESEL I/M PROGRAM portion of the PM10 SIP or more effective procedures that may be identified during the Implementation Evaluation to be conducted by the Utah I/M Board between Sept 30, 1990 and Sept 30, 1991.
Oct 1, 1990 ...	PM10 SIP-Regulations for Utah County and parts of Salt Lake and Davis Counties are Sent to EPA for Approval
Nov 1, 1990 ...	Begin Diesel I/M Pilot Study Program (if funds available) and initiate Public and Diesel Industry Education Program
July 1, 1991 ...	Written Notification to Diesel Industry Organizations and Publications
Jan 1, 1991 ...	Diesel I/M Counties Begin Assessing \$10 Air Pollution Control Fee Upon Every Diesel-Powered Motor Vehicle Registered
Sept 1, 1994	Salt Lake County Diesel I/M Regulation adopted
Oct 24, 1994	Utah County Diesel I/M Regulation adopted

Dec 15, 1994

Davis County Diesel I/M Ordinance adopted

Oct 30, 1991 ... Diesel I/M Program Orientation Available to Law Enforcement Agencies

Nov 1, 1991 ... Enforcement of Opacity Limits by Law Enforcement Officers

May 9, 1992 Diesel meeting at North American Motor Vehicle Emissions Control Conference (NAMVECC) to discuss national diesel emission control equipment and test standards

Nov 1, 1994 ... Fleet and Public Diesel I/M Program Provisions Become Effective

The Diesel I/M Program regulations, ordinances, and requirements specified in Section XXI shall continue until a maintenance plan without a Diesel I/M program is approved in accordance with Section 175 of the Clean Air Act as amended.